PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Wolfgang BILLINGER, et al. Group Art Unit: 3644

Serial No.: 10/053,666 Examiner: Dinh, Tien Quang

Filed: January 24, 2002

For: DEVICE FOR CONNECTING MOVABLE PARTS WITH STRUCTURAL ELEMENTS OF AIRPLANES AND THE LIKE

PRE-APPEAL BRIEF REQUEST FOR REVIEW

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This Pre-Appeal Brief Request for Review is being filed in response to the Final Office Action mailed October 16, 2007 (Paper No. 20071012). A Notice of Appeal is being filed concurrently herewith. Claims 15, 19-28, 30 and 32-34 are pending in the application. Claims 15, 27, 28 and 30 are independent. All of the pending claims stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,234,423 to Hirahara, et al. ("Hirahara"). No amendments are being filed with this request. Applicants request review of the final rejection in the above-identified application for the reasons set forth herein.

The claims as currently pending are directed to a *fitting* made of a synthetic composite material according to a resin transfer molding (RTM) method and used to connect a movable part of

an aircraft to a structural component thereof. While the Examiner acknowledged that Hirahara does not use a RTM method, he stated that the method of production, being a product by process limitation, does not contribute to the patentability of a product. However, as was further stated by the previous Examiner, Mr. Holzen, in the Office Action mailed May 17, 2006, a product by process limitation *does* bear on patentability if the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. In so stating, Examiner Holzen requested that Applicants provide evidence in the form of a affidavit or declaration that the RTM method provides distinctive structural characteristics that would not be realized by the method of production taught in Hirahara.

Accordingly, in Applicants' last response filed August 2, 2007, favorable reconsideration of the pending claims was requested and supported by the Rule 132 Declaration of Helmut Kaufmann. In view of Mr. Kaufmann's credentials as an expert in the field of composite technology as related to aircraft, reconsideration of the evidential value of his Declaration in view of the absence of any rebuttal evidence by the Examiner is requested.

First, however, Applicants request reconsideration of what is actually disclosed in Hirahara in light of Mr. Kaufmann's Declaration. Particularly, with respect to the airfoil structure

of Hirahara which has an upper skin, a lower skin and a spar (see the abstract of Hirahara), the Examiner's rejection depends upon interpreting the spar 13, which includes two flanges 13a and a web 13b, as a "fitting". This conclusion is not supported by Hirahara and is further shown to be incorrect by Mr. Kaufmann's Declaration.

According to Hirahara, the spar is made by forming a laminate of composite prepreg into a U-shaped cross sectional shape and molding it under heat. The spar is thereafter fitted to the upper and lower skins and pressed by load application blocks 34 in a bonding jig 30 to form a *single airfoil structure* (see Figures 11 and 12; column 6, lines 18-29). Neither 13a nor 13b are used *to connect* the airfoil structure to the aircraft structural component; rather, as stated in Hirahara itself, elements 13a and 13b are part of the *airfoil structure*.

In his Declaration, Mr. Kaufmann identifies a fitting as a *hinge*, and identifies the fitting/hinge in Hirahara as being represented by the six unlabeled hinges shown in Hirahara Figure 2. In discussing these fittings/hinges, Mr. Kaufmann states that "*Hirahara does not address the hinges at all*, but only methods of forming the box structure of the movable surface" (emphasis added). As already explained, elements 13a and 13b are part of the box structure of the airfoil structure itself, i.e., of the movable part; they are not "fittings" as that term is known and understood

in the aircraft industry to refer to components used to connect a movable part to a structural component of an aircraft. The Examiner has offered no evidence to rebut Mr. Kaufmann's Declaration.

Second, turning now to the patentable weight of the product by process limitation, Mr. Kaufmann states that, due to significant wall thickness differences between hinges and airfoil web and flange structures, the manner of production disclosed in Hirahara for the spar 13 could not produce a composite part together with *the fitting* such as that being claimed in the present application. Only the RTM-produced hinge fitting of the claimed invention has the required mechanical properties to be used in place of a metal fitting in connection with parts having significant wall thickness differentiation (see paragraph 10 of Mr. Kaufmann's Declaration). And there is nothing in Hirahara to suggest that the *fittings* therein, properly interpreted as the unlabeled hinges secured to the web and flanges of the spar (see Figure 2 of Hirahara), are made of anything other than a conventional metal construction.

Mr. Kaufmann further states in paragraph 11 that resins used in fiber reinforced systems such as RTM have modified flow characteristics due to the additives that are added to the resin to attain the mechanical properties needed in order for the fitting

made by the RTM method to be suitable for its intended use. Hence, in paragraph 12, Mr. Kaufmann summarizes by stating that a fitting made of synthetic composite material according to the RTM method *is "structurally different"* from the structure and process disclosed by Hirahara for forming the box-structure airfoil and is not obvious in view thereof. The Examiner has offered no evidence to rebut Mr. Kaufmann's Declaration.

In view of the foregoing evidence relating to the proper interpretation of the term "fitting" and the structural differences resident in a fitting made by the RTM method, as provided by Mr. Kaufmann and already of record, claims 15, 27, 28 and 30, along with the claims dependent thereon, are patentable over the prior art. Applicants request that the rejections be withdrawn and the application passed to issue.

Respectfully submitted,

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